

SECTION III TECHNICAL SPECIFICATIONS.

3.0 TECHNICAL / EQUIPMENT SPECIFICATIONS

3.1 General Equipment Specifications

The intent of these specifications is to provide a complete and satisfactory operating Enhanced 9-1-1 Emergency Communications System, with ANI and ALI for Key West, Monroe County, Florida Public Safety Answering Point (PSAP). All equipment and installation material required to fulfill the above shall be furnished and installed whether or not specifically enumerated herein. The installation will be handled as "turnkey project," including delivery, installation and satisfactory check out of all equipment.

Positron Response: Read & Understood

Installation of all equipment and wiring will be the total responsibility of the Bidder. The Bidder will have total responsibility for system compatibility and successful performance. The only work not included in the installation project would be work involving building construction (e.g., moving or adding any necessary doors, walls, etc.).

Positron Response: Read & Understood

3.2 Performance

A distributed processor architecture shall be used so as to meet the performance demanded by an E9-1-1 environment. Every module shall function independently of the others. There should be no situation in which a processing bottleneck could occur.

Positron Response: Comply

The non-blocking design of the Life Line 100 controller ensures that all calls can be processed simultaneously, eliminating any potential bottlenecks. Each Network Interface Module (NIM) is connected to only one 9-1-1 trunk. System reliability is enhanced by Life Line 100's distributed microprocessor architecture allowing each module to operate under its own control. This independent operation ensures no single point of failure. Built-in redundant, hot stand-by modules ensures uninterrupted service and makes the Life Line 100 ideally suited to critical E9-1-1 applications.

The existing Life Line 100 controller is fully compatible with AT&T database communication protocol, and transmits requests for ALI information to the ALI database on two ports.

Each call processing module shall be equipped with a dedicated MF receiver to avoid delays in decoding ANI. (Systems which force incoming calls to wait for an available MF receiver before presenting the call will be given secondary consideration.)

Positron Response: Comply

The NIM module in the Life Line 100 is designed to perform call processing, central office interface and telephone set functions. One NIM card is provided for each incoming E9-1-1 trunk. Every NIM performs its functions independently of the other NIMs on the shelf. This includes the reception and decoding of MF tones. Every NIM module has a built-in MF receiver to ensure a total non-blocking architecture.

Communication with the ALI database shall be full duplex.

Positron Response: Comply

ALI requests shall be made immediately after ANI has been decoded. (Systems which wait for the call taker to go off-hook before sending requests for ALI will be given secondary consideration).

Positron Response: Comply

3.3 Reliability

No single point of failure will render the system non-functional.

Positron Response: Comply

Positron has configured the proposed Life Line 100 controller to include full redundancy. The following describes the redundancy features available on the proposed Life Line 100 E9-1-1 system.

Power

The Life Line 100 AC/DC module provides DC power to the system and offers the possibility of recharging the battery backup module, if installed. The AC/DC module is installed redundantly on each shelf. Therefore, when redundant modules are available, one module provides power to the system and the other remains on standby. The inactive AC/DC module becomes functional if the first one fails.

Conclusion: *No single point of failure.*

Communications Module

The COM module communicates with all modules on a per shelf basis, each via independent links. It also provides communication to external devices such as the ALI database and all other system administrative ports. Battery backup is provided for the clock/calendar and RAM banks by an on-board lithium battery. The COM module on each shelf is configured for redundancy. One module then operates in Active mode, and the other in Standby mode. Each module monitors the health of the other by monitoring hardware handshaking signals, as well as those generated by the software. The standby module becomes functional if the first one fails.

Conclusion: *No single point of failure.*

Serial I/O Module

The SIO module provides communication with up to twelve displays on a per shelf basis. Independent ports and links are provided to each display. A failure of one port or link does not cause a complete module failure. Each display can operate independently of another. The SIO module on each shelf is configured for redundancy. One module operates in Active mode, and the other in Standby mode. Each module monitors the health of the other by monitoring hardware handshaking signals, as well as those generated by the software. The standby module becomes functional if the first one fails.

Conclusion: *No single point of failure.*

Signaling Module

The SIG module provides the generation of both lamping and ringing. The lamping generator converts -48 VDC from the Life Line 100 into 10 VAC. This provides a lamping battery source on 1A2 key signaling equipment. The ringing generator converts -48 VDC from the Life Line 100 into 105 VAC. This provides a ringing battery source for application to a network or to an external ringing device. The SIG module on each shelf is configured for redundancy. One module operates in Active mode, and the other in Standby mode. The NIM modules monitor the lamping and ringing and automatically cause the switchover of the SIG module. The standby module becomes functional if the first one fails. With the Positron Life Line 100, should any module fail that will not allow the presentation of a call, the system can automatically busy-out the associated 9-1-1 trunk to the CO. This alerts the CO of a problem immediately. Any failure within the system will also create an alarm condition. This can be either a local alarm, a remote alarm, or both. This ensures immediate attention, even when modules are installed redundantly.

Conclusion: No single point of failure.

Network Interface Module

The NIM module is designed to perform call processing, central office interface and telephone set functions. The NIM Module cannot be installed redundantly due to the inability of the network to provide redundant 9-1-1 trunks. However, all major components on the NIM module are redundant. These include:

- (a) Call progress tone generator
- (b) Call progress tone receiver
- (c) DTMF receiver
- (d) DTMF generator
- (e) Ringing voltage selection
- (f) Ringing voltage detection

Every NIM performs its functions independently of the COM module, or other NIMs on the shelf. This includes the reception and decoding of MF tones. Every NIM module has a built-in MF receiver to ensure a total non-blocking architecture. The COM module only provides the NIM with configuration information. The NIM provides the COM module with ANI information, agent connection/disconnection information, as well as statistical, maintenance, and other information related to call processing. Should one module fail, it affects only the trunk associated with that module and does not create a complete system failure.

Conclusion: No single point of failure.

Processing power shall be distributed among the E9-1-1 controller modules. There will be no central controlling module, and all modules shall function independently of each other.

Positron Response: Comply

Each line interface / call processing module will serve one trunk, one call taker, and one transfer position. The state of a line interface/call processing module shall have no effect on the performance of another. This is necessary in order to prevent heavy trunk traffic, false trunk seizures, line failures, or defective line interface/call processing cards from affecting service to trunks handled by other line interface/call processing cards on the E9-1-1 controller.

Positron Response: Comply

Hardware redundancy and automatic switchover shall be provided on the various modules where appropriate.

Positron Response: Comply

Modules that provide communication to external devices such as ALI databases and all other system administrative ports shall be configured with redundancy. One module shall operate in an active mode and the other in standby mode. The standby module shall become functional automatically if the first one fails.

Positron Response: Comply

The COM modules in the Life Line 100 controller provide this functionality and are configured redundantly, as described previously.

Modules that provide communication to ANI/ALI display shall be configured with redundancy. One module shall operate in an active mode and the other in standby mode. The standby module shall become functional automatically if the first one fails.

Positron Response: Comply

The COM modules in the Life Line 100 controller provide this functionality and are configured redundantly, as described previously.

If the module provides communication to more than one display, independent ports and links shall be provided to each display. A failure of one port or link shall not cause a complete module failure. Each display shall operate independently of another.

Positron Response: Comply

The SIO modules in the Life Line 100 controller provide this functionality and are configured redundantly, as described previously.

All power supplies shall be redundant and distributed. A power related fault on a E9-1-1 controller module shall not affect the power supplied to other modules.

Positron Response: Comply

Power for the Life Line 100 components is provided via redundant AC/DC modules on each Life Line 100 shelf.

It shall not be necessary to power down the E9-1-1 controller in order to replace modules. In addition, it shall be possible to remove redundant modules that are in standby mode from the E9-1-1 controller without any interruption in service. All redundant modules shall be accessible directly from the front of the controller without the need of removing cables from the rear of the controller or module.

Positron Response: Comply

DC power battery backup for the E9-1-1 controller shall be provided as an option.

Positron Response: Comply

3.4 Expansion

The E9-1-1 controller shall be modular, supporting from one (1) to over (100) E9-1-1 Trunks in increments of One (1) Trunk with appropriate additional equipment.

Positron Response: Comply

The Life Line 100 Controller has been engineered to meet the strict demands of E9-1-1 Emergency response. The built-in modularity allows customers to design a system capable of meeting current needs and budget with easy future expandability. The following summary provides basic information on system expandability:

- The Life Line 100 controller equipment is contained in seven (7) foot Cabinets. Each cabinet can hold up to three (3) shelves of controller equipment.
- Each controller requires a minimum of one (1) shelf, which may be expanded to sufficient shelves to accommodate over 100 trunks.
- Each shelf is capable of containing from one to eight 9-1-1 trunk cards (NIM Cards) and in most applications each shelf can provide up to twelve display ports for call-taker displays. (Particular configurations may cause variations).

The addition of call-taker positions or extra 9-1-1 trunks may be as easy as just adding additional telephones and displays or NIM cards to the existing system. In some instances it may be necessary to add an additional shelf (and possibly cabinet) in order to expand to a given number of positions or trunks.

Each controller shelf shall accommodate up to Eight (8) E9-1-1 Trunks. It shall be possible to populate any empty Trunk card slot simply by adding a Trunk Interface Card, without requiring software or hardware upgrades (other than the additional Trunk Interface cards).

Positron Response: Comply

Answering Position handling shall be modular as well, with the ability to scale from 1 to over 100 answering positions with appropriate additional equipment.

Positron Response: Comply**3.5 Specific E911 Controller System Features**

All features described in this section relate to North American Standards for E9-1-1 systems in both trunking and central office features.

Positron Response: Read & Understood

3.5a Voice Transfers

The E9-1-1 controller shall be equipped to perform tandem voice transfers. Voice transfers may be either speed or manually dialed. Once a transfer connection is established, the equipment will allow a three-party voice conference.

Positron Response: Comply

The Life Line 100 executes requests for dial-up line voice transfers. It is equipped to perform voice transfers directly within the unit, or alternatively at a tandem CO. Voice transfers may be either speed or manually dialed. A Life Line unit may be connected to up to eight dial-up transfer lines per full shelf.

When a transfer connection has been established, a three-party voice conference can be held. The unit gives the call taker the option to mute the 9-1-1 caller in order to speak confidentially with the transfer position. The transfer position may do the same provided it is equipped with a Positron ANI/ALI display and control device, and a telephone link to the Life Line Unit.

The voice transfers feature allows each call taker transfer button to be programmed with up to four telephone numbers to the same destination. This feature is attractive when a destination is equipped with two, three, or four telephone lines. If a first request to transfer to this position is met with a busy signal, a call taker could immediately ring the same destination via up to three alternate lines by simply touching the same transfer key a second, third, or fourth time.

3.5b Incoming Trunks

The E9-1-1 controller shall be equipped for a customer defined number of E9-1-1 Trunks, with each trunk card individually configurable to either standard CAMA with MF signaling, or to Enhanced MF for 10/20 digit handling.

Positron Response: Comply

Positron has sized its system to accommodate 8 E9-1-1 trunks.

3.5c Logging Recorder Interfaces

The proposed system shall provide start signals for logging recorders and call check conversation recorders. The start signal should be activated when the call taker goes off hook, and deactivated when the call is released.

Positron Response: Comply

The proposed Life Line 100 includes a recorder feature which provides the control signals necessary to record the conversation between an incoming caller, an answering agent, and/or a third party. The Life Line system provides nine (9) dry contact recorder start leads per shelf. This permits connection of up to eight single track recorders per shelf (one per answering position line) and/or one 8 track recorder per shelf. Recorders are started when an agent answers an incoming call. Recorders are stopped when the call is released.

Alternatively recorders may be connected directly to the answering position equipment.

It should also be noted that each Power 911 position will include the Power 911 Integrated Call Recorder module.

3.5d Buzzer/Relay Contacts

Four independent solid state relay contacts shall be available for switching of AC or DC powered devices.

Two of the contacts shall be controlled by the call processing modules and will allow selective ringing depending on which trunk is originating the call.

The two remaining relay contacts shall respond to open or close commands entered as DTMF tones dialed from call taker telephone set keypads (for remote control of doors, air conditioners,...)

Positron Response: Comply

3.5e Alarms

Three alarm levels will be generated in response to abnormal occurrences requiring the attention of maintenance or supervising personnel:

- ☐ Minor.
- ☐ Major.
- ☐ Critical.

Four solid state relay contacts shall be provided, three of which correspond to an alarm level.

Positron Response: Comply

In order for maintenance personnel to be alerted when trouble conditions are detected by the Life Line, trouble conditions must be classified according to their level of gravity. Trouble conditions are classified as shelf down, critical, major, or minor. Each existing trouble condition must be assigned a critical alarm, a major alarm, a minor alarm or no alarm. In addition, a threshold can be assigned to different types of trouble conditions. This threshold indicates the number of times an alarm condition must occur before a higher alarm level is triggered. Critical, major, and minor alarms are alerted by alarm indicators. Alarm indicators include visual signals (LEDs), audible signals (buzzer or beeping on maintenance terminal), and/or calls to a remote diagnostic monitoring and maintenance service center.

3.6 Maintenance Terminal

A maintenance terminal interface shall provide the following interaction with the E9-1-1 controller:

Diagnostic mode To display all event, diagnostic and error messages as they occur.

Maintenance mode To program and configure the E9-1-1 controller (program interface parameters, assign telephone numbers, reset alarms, generate reports, select options). The programming and configuration procedure shall make use of a hierarchical menu structure. Once the desired sub-menu is reached, most entries shall be made by selecting a number from a list. Maintenance mode shall be password protected to ensure system security.

Positron Response: Comply

Positron has configured the proposed Life Line 100 controller to include Remote Monitoring and Maintenance capabilities via a diagnostic terminal. As the remote maintenance (diagnostics) terminal performs the same function as the local maintenance terminal, the latter is described first.

Maintenance Terminal-

The maintenance terminal is the main programmer's, administrator's, and maintenance technician's interface with the system. In diagnostic mode, the terminal displays all event, diagnostic, and error messages as they occur.

In maintenance mode, Life Line is programmed and configured via the terminal. The terminal's maintenance mode is typically used to program interface parameters, assign telephone numbers, reset alarms, generate reports, and select options. The programming and configuration procedure is facilitated by a hierarchical menu structure. Once the desired sub-menu has been reached, most entries are made by selecting a number from a list. Maintenance mode is password protected for security of the system.

Maintenance Printer

The maintenance printer prints a hard copy of system error messages appearing on the maintenance terminal. A hard copy record of system messages is essential for diagnosing and debugging. In programming this feature, the customer has the option of also directing status and diagnostic messages to this printer. The printer is also used for printing statistical reports, as well as the contents of the alarm and error history buffers.

Statistical Reports

The system maintains statistics on database communications, trunk and line traffic. Also retained is a chronological history of alarm and error messages. Reports of this data may be sent to the maintenance printer upon request of the system supervisor. This information can be indispensable to maintenance and administration personnel.

Remote Diagnostics

The remote maintenance (diagnostics) terminal performs the same function as the local maintenance terminal previously described. The remote terminal is an invaluable time saving feature when maintenance personnel operate from a center located off the premises of the Life Line installation. Since the display is connected to the Life Line via the public telephone network, a terminal at a central maintenance depot can serve a number of Life Line installations. The Life Line unit equipped with the remote maintenance terminal feature can both receive and originate calls to the maintenance center.

The Life Line receives a call from the remote maintenance terminal whenever intervention is required from the maintenance center. After a connection has been established, maintenance specialists can fully communicate with the system.

The Life Line can be programmed to originate a call to up to four maintenance centers upon occurrence of an alarm. When an alarm occurs, the system will sequentially dial up to three telephone numbers until an answer is received and the answering remote site logs on with a valid password. Failing that, the system dials a fourth number expected to be the location of a data dump. If this station does not answer, part or all of this calling sequence will be re-attempted depending on how the system was programmed to react to this situation.

3.7 Maintenance Printer

A maintenance printer interface shall drive a printer to provide hard copy of system error messages.

Positron Response: Comply

3.8 Statistical Reports

The E9-1-1 controller system shall maintain statistics on:

- Database communications.
- Trunk traffic.
- Chronological history of alarm and error messages.

Positron Response: Comply

The proposed Life Line 100 E9-1-1 controller has built-in statistical reports. In addition, the optional Power MIS software can provide additional management reports. The built-in statistical reports are described below.

Built-in Statistical Reports

Statistical Reports consist of various counters that keep track of system activity, incoming call traffic, database communications, and incoming trunk/line traffic. These reports are output to the maintenance terminal and maintenance printer. In addition, these reports can be reset and printed manually or automatically. Each time a report is reset, it is printed prior to the reset.

Incoming Call Traffic & Performance

- Number of processed and test calls
- Number of abandoned calls
- Number of calls with good ANI
- Number of calls with good ALI
- Number of calls with bad or no ALI
- Number of executed transfer requests

Database Communications Performance

- Number of ALI with no Type
- Number of Type 1 received
- Number of Type 2 received
- Number of No ALI Found
- Number of ALI errors
- Number of unanswered requests

Incoming Trunk/Line Traffic & Performance for Each Trunk/Line:

- Number of calls on that trunk
- Number of times tone errors detected
- Number of times incomplete ANI received
- Number of times no tone error detected
- Number of abandoned calls

3.8a Automation Call Detail Record Printer

An ACDR printer interface shall be provided.

An automatic call detail record (ACDR) shall be printed by the system every time a call is released.

The information contained in each ACDR includes:

- The caller's ANI and ALI.
- Position of agent that answered the call.
- Transferred destination.
- Date, times of the various connect and disconnect events, and other particulars relating to a call.
- A time and date stamp is automatically printed every hour.
- Incoming trunk Identification

Positron Response: Comply

3.9 ALI Database

The E9-1-1 controller shall support dedicated redundant data links to the TelcoALI database and the redundant stand-alone on site database.

A request to the database shall be made as soon as caller ANI is received.

The E9-1-1 controller shall compare the telephone number returned with the ALI to the original ANI sent by the CO, ensuring that caller ALI is matched with ANI. If the received ALI is unclear or incomplete, a call taker must be able to command the system to repeat the request to the database.

The stand-alone database shall be updated upon installation and will be an automatic transfer function upon loss of enhanced telco provided enhanced 911 trunks.

Positron Response: Comply

SECTION IV TELEPHONY FEATURES.

4.0 Telephony Equipment Features

4.1 General Requirements

The proposed system shall be capable of operating in a mixed environment whereby:

- Some answering positions are equipped with a desktop or panel-mounted phone set under control of an Intelligent Workstation (IWS) computer, and
- Other positions are equipped with a “virtual” phone set located within the IWS workstation computer which controls it (i.e. there is no external phone set at the position).

Regardless of which approach is used at a given position, the Intelligent Workstation computer shall have control of telephony functions (specifically, when a separate phone set is used, the call-taker can perform ALL telephone functions via the Intelligent Workstation using the external set only as a backup or alternate).

The required number of IWS positions equipped with external phone sets is 4.

The required number of IWS positions equipped with “virtual” phone sets is 0.

Positron Response: Comply

4.2 Distributed Architecture

Each module shall operate under control of its own microprocessor. There shall be no single point of failure affecting more than one line or one console.

Positron Response: Comply

Life Line 100

The Positron Life Line 100 controller has been engineered to meet the strict demands of E9-1-1 emergency response. The non-blocking design of the Life Line 100 ensures that all calls can be processed simultaneously, eliminating any potential bottlenecks. System reliability is enhanced by the Life Line 100's distributed microprocessor architecture allowing each module to operate under its own control. This independent operation ensures no single point of failure.

Power 911

Power 911 offers the following fault tolerance features:

Failure of a workstation: No effect on other positions or on the Power 911 network. In addition, should a workstation fail while the calltaker is speaking with a caller, voice contact with that caller is maintained.

Failure of the network hub: All positions continue to operate, although information will not be shared between workstations. The workstations will continue to store all information locally. When the network resumes normal operation, the Database Server will be updated with the locally stored information, which will then be available to all positions.

Failure of the Database Server: All positions continue to operate, and information is still shared between workstations, as the Power 911 network is configured with redundant virtual object servers, one of which resides on the Database Server, the other of which runs on one of the Workstations. When the network resumes normal operation, the Database Server will be updated.

Failure of the Comm Server: (if system is equipped with the optional Communications Server) The transmission of ANI/ALI data will not be possible via Fax Transmission. Dial-up data transmission to remote serial printers will still be possible via the Life Line 100 E9-1-1 controller.

4.3 Modularity / Flexibility

The design shall be modular to allow for future expansion beyond present requirements.

Positron Response: Comply

SECTION V INTELLIGENT WORKSTATIONS

5.0 Intelligent Workstations

5.1 General Requirements

Four (4) PC-based Intelligent Workstations are required. These must be fully 32-bit applications running under the fully 32-bit Windows NT environment. Windows 9x and/or 16-bit code are not considered stable enough and will therefore not be considered.

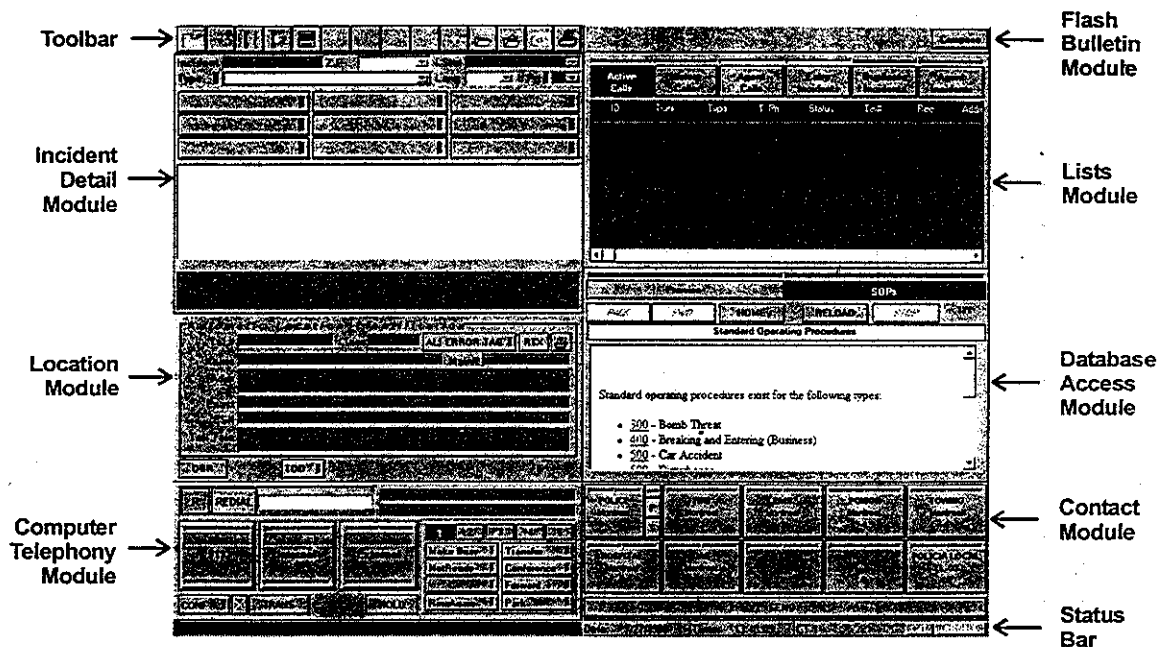
A true Microsoft SQL database shall provide data storage for both configuration and operational data. This is meant to ensure the use of an enterprise-class database engine that is robust and widely supported. Office application-class database engines (such as Paradox, FoxPro, Access, etc.) are not considered robust enough for an emergency-response environment and therefore do not meet this criteria. Workstations and servers shall be manufactured by Compaq, and equipped with at a minimum PII-450 MHz Intel Processors, 128M RAM and a 17-inch flat screen monitor.

Positron Response: Comply

Power 911 Features

The Positron Power 911 Intelligent Workstation is an advanced integrated computer based open workstation for 9-1-1 call-takers, dispatchers and supervisors. The system's open architecture operates through a Microsoft Windows NT graphical user interface and can run on a variety of PC platforms. The Positron Power 9-1-1 system places a sophisticated and powerful package of computer telephony tools, user screens and database interfaces at the call-taker's fingertips. The system is intuitive and dynamic, presenting the call-taker with interactive prompting, notification of database modifications and data networking. The system also allows extensive customization capabilities to meet specific PSAP requirements.

Typical Power 911 GUI



The Power 9-1-1 Intelligent Workstation can be configured to include the following features:

- (a) **Number/Location Identification** - The Power 911 Intelligent Workstation offers a great deal of flexibility in handling ANI/ALI information. For example, while the incoming ANI and ALI information resides permanently in the database the information is presented to the call-taker in a data entry mode which allows call-takers to modify the information without affecting the original ANI/ALI data. All information is easily shared between call-takers.
- (b) **System Toolbar** - The Power 911 Intelligent Workstation provides the ability to program buttons to allow for "point & click" access to frequently used features and commands such as fast coding of incident, deferred dispatch, and print on demand, as well as starting up other Windows NT executables.
- (c) **Supervisory Functions and Call Lists** - The Power 911 Intelligent Workstation offers the supervisor and PSAP managers a package of data handling tools. These tools allow the viewing of the center's activity as it happens, and the ability to see detailed information on active or historical calls. Supervisors and managers have the capability of filtering and viewing data in any number of ways, including viewing all active calls and all abandoned calls. Multiple filters are available which can be combined to view information in even greater detail.

- (d) **Message Board** - The on-line message board provides the ability to broadcast of a visual message to all agents, a select group of agents, or even a particular agent logged in to the system without interrupting call-taker activities. Call-takers have the ability of acknowledging a message sent by the supervisor. The Message Board also provides configurable pre-programmed messages via both speed button and drop-down list.
- (e) **Call Transfer Functions** - The Power 911 Intelligent Workstation can greatly expand the variety and volume of information that can be transferred over the existing standard technology. The Workstation is programmable to recommend primary transfer destinations based on incident type. The call-taker has the ability to send different types of information such as ANI/ALI and additional location data. The workstation can simultaneously transfer this data to multiple locations such as Fire and Police over a variety of communication modes to access remote printers, fax machines, and even other Intelligent Workstations.
- (f) **Telephone Functions** - The Power 911 Intelligent Workstation allows call-takers to have on-screen access to all telephone features and provides up to five (5) different call queues which can be configured with different line types and characteristics. These queues can be accessed by the mouse, and/or keyboard, and/or optional touchscreen. The call queue indicators also display critical real-time information such as:

- The number of calls in a particular queue.
- The time the oldest call has been in queue.
- The trunk number or line number of an incoming call.
- The various line status such as ringing or off-hook condition.

The Power 911 Intelligent Workstation has the ability to show all trunks and lines associated with each individual queue. Lines are also accessible directly via a secondary line panel window, allowing calltakers to bypass the call queue to answer a specific line. The lines are also accessible to other call-takers after the initial answering of a call, which allows for both silent monitoring and barge-in type features.

All standard telephone functions such as hold, hold indicator, redial, release, cancel, and transfer/conference, are available on-screen through the Intelligent Workstation.

- (g) **Interpreter Key** - The Power 911 Intelligent Workstation allows the call-taker to change the language of the pre-programmed questions presented to them in the (optional) Incident Detailing section of the screen, as well as the pre-programmed TDD questions (when using the optional integrated on-screen TDD).